Criteria Assessment Protocol Workgroup

March 8th 2019
10 a.m. – 12 p.m.

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Webinar*: https://zoom.us/j/976173645
Meeting Materials:
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Location: Fish Shack, CBPO

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AGENDA

10:00AM **Welcome, introductions & announcements** – *Peter Tango, Chair Criteria Assessment Protocol workgroup, USGS@CBPO*

Peter mentioned the membership list needs to be updated.

10:10AM **James River chlorophyll-a criteria revision updates – *Tish Robertson (VADEQ)***
Material: Presentation

The proposed updates to the James River chlorophyll-a criteria summarizing work from a seven year study have been published to the Virginia register of regulations http://register.dls.virginia.gov/vol35/iss11/v35i11.pdf . The public review and comment period closes on March 22, 2019. This is an opportunity to touch bases once more on any final considerations regarding the criteria updates.

DEQ is now proposing not one but two sets of chlorophyll-a criteria for the tidal James River. This includes a spring and summer seasonal mean criteria and short-duration criteria (summer only). They are including 10 seasonal mean criteria proposals with a frequency of no more than two exceedances every six years. When comparing to the existing seasonal mean criteria, they are mainly proposing a lower magnitude except for two during the summer. Changes in magnitude reflect changes in chlorophyll concentration and improved understanding on how phytoplankton are linked to certain adverse effects. The proposed short-duration criteria are different because the magnitudes are aimed at protecting aquatic life from short term exposures. The frequency is also no more than 10% exceedance over six years. The duration is either one month or one day to reflect the different algal blooms they are trying to protect from which would not show up in the seasonal means. She then provided the current

assessment methodology which consists of conducting monthly monitoring runs, interpolating each run, creating a seasonal "snapshot," and calculating the exceedance rate. If the reference curve crosses the assessment curve, the point is taken as criteria non-attainment. However, they are thinking of moving away from this approach for chlorophyll supported by research into the assessment methods. This would consists of creating a median from samples pooled over a particular day to represent the chlorophyll for that day and apply the 1-day Median criterion to where it is applicable. They would convert the "daily values" into a monthly estimate and choose the median again and apply the 1-month Median Criterion to where it's applicable. The next step uses the monthly medians to find a seasonal estimate. The proposed assessment methodology takes into account the non-uniformity in spatial distribution of chlorophyll expression in the two tidal fresh segments. The new methodology will not do a shoreline-to-shoreline interpolation of all monitoring datasets. It will only generate grid cells in ArcGIS that were monitored. They will still use the Interpolated grid but only interpolate data if it is spatially intensive.

Gary asked if the proposed criteria was more stringent. Tish responded that it is less stringent.

Claire asked if she had retrospect with historical data looking at comparing attainment with the two different methods. Tish said they have looked at historical data, along with comparing it to the model.

Joe asked if she had found a similar result or done a review with the proposed method. Tish mentioned the technical support document delves into methodology and its performance. It discusses more why the proposed methodology is better than what they are currently doing.

Richard stated that for one segment the critical values could raise from 15 to 21 which represents an increase in criteria. Therefore, he asked if Tish had any concerns about higher criteria. Tish responded that it will most likely not cause harmful effects, but when reviewing the assessment methodology for the dataflow, they realized they didn't have data for the lower portion of the upper tidal fresh so the estimates for the original criteria were on the low side. The higher magnitude than helps clarify what is happening in that segment.

Peter asked how prescriptive they were with the actual sampling when they said they evaluated a one day mean. Are the frequencies you are allowing for part of the test you completed? They found they have to do a lot of sampling to do a "good job," but that depends on what you define as a "good job." The short-duration criteria emphasizes the need to go out and get data and not be satisfied with a few samples.

Joe mentioned he had a concern for back-to-back exceedances to occur. Tish said she would pass along the technical support document because it mentions why 2 and 6 is just as good as 1 and 3.

Peter mentions that sampling design needs to be revisited for future meeting discussions. Tish comments that dataflow might want to be used to discover where to add or shift a station. He also said that maybe a larger discussion is needed on frequency, and the angles in which we justify it remains a science question. Maybe a syntheses from studies already completed is needed or understanding what work needs to be done.

Feel free to provide comments during the open comment period until *March 23rd*.

10:40AM **Status of Dissolved Oxygen Restoration Variances – *Gary Shenk (USGS@CBPO)***
Material: Presentation

Computing the Water Quality Standards indicator relies on the definition of criterion thresholds. Some segments have been provided site specific dissolved oxygen criteria in the past. Some segments have adjustments through restoration variances. Gary provides a summary of the process underway documenting the most recent variances that will be needed for 303d listing assessments and therefore also updating in the Water Quality Standards Indicator score assessments.

Gary goes over how they did the assessment of dissolved oxygen standards in the midpoint assessment. The water quality standards for the TMDL have not changed since 2010, and they only do a 30-day mean for dissolved oxygen. They apply the model by first starting with 1993 – 1995 observed data and then apply the criteria assessment procedures. They get the criteria achievement in the critical period. Then they compare between the calibrated model and model scenario by doing a regression for each point and each month and use only the change between the calibrated model and a given scenario. They apply the changed analysis to the observed dataset so it is now modified by the predictions of the estuarine model. They then run the criteria assessment procedures on the now "observed" scenario. In 2017, they looked at different scenarios of nitrogen and phosphorous input to the Bay. The graph Gary presented showed at some point you do not receive more criteria attainment for additional reductions and this is where the partnership chose the TMDL limits in 2010 and planning targets in 2017. A decision was made in spring 2018 that loads would be allocated such that CB4MH DC dissolved oxygen attainment would have a violation exactly equal to 6.49% (beyond the allowable 10%, hence the use of a variance). Maryland's restoration variances were established in 2010 and updated in 2012.

PSC supports Maryland moving forward with its water quality standards regulatory process which makes it CBP policy to go ahead and support that, and it is based on the modeling described in this presentation.

What level of documentation is needed? Gary said it depends on the Partnership's needs.

11:05AM **Discussion: K_d Regression Updates – All.**

In 2018, the CAP WG highlighted a desire to revisit the the K_d regressions used for producing water quality acres assessments. Let's use this time to discuss a plan for addressing the regressions, who will be responsible for the work (e.g., form an action team? STAR analysis team request? Other?) and what timeline we are targeting with finalizing any revisions to the regressions that will affect the WQS indicator score assessments.

DEQ and MDNR

Mark: In Maryland, they do the assessment every two years and during the process new data from the new segments they begin to monitor is sent to Elgin, and he creates the regression analysis. Salinity used to be a parameter but now it is just done on a segment basis. Concerns include for a segment there was no data to put in to make a path, one cruise may be clear but other cruises may be different, segment setup/boundaries are weird, and some instances there is not enough remaining shallow water acres.

VADEQ

Tish: Trepidations for using K_d Regression from the 2008 document because they were over estimating non-attainment. This is similar to Mark's remark of how no matter what you put in, you will not get attainment. They are doing what Mark has been doing by creating site specific regressions. They are finding the results are no longer just non-attainment. Only major difference between what Maryland and Virginia is doing is the regressions.

Richard asked Mark if they could add K_d. Mark responded that they do use K_d. Richard followed with asking why do they need to do the regression to calculate the K_d. Mark said the reason is because they cannot collect continuous K_d.

The workgroup's action going forward is going over the concerns about the process and how to document the updates about what they are doing such as using site specific data instead of historical groupings.

Carl Friedrich's asked to be included in everything going forward on this discussion since he is taking over for director of CBNERR.

11:30AM **Assessing possible advances in SAV acreage assessment: STAC workshop proposal – *Brooke Landry (MD DNR, Chair of SAV Workgroup)***
Material: Presentation

Led by the SAV WG, a proposal was submitted for CBP-STAC consideration in the latest round of requests for STAC workshop proposals to update the SAV monitoring program with the use of new satellite imagery and interpretation algorithms. In 2018, there were multiple program challenges to providing a full, baywide SAV assessment including poor weather conditions and high turbidity/poor water clarity for effective aerial overflight surveys. Researchers are exploring the use of new, high resolution satellite imagery for improving the SAV survey. Researchers are also attempting to use 2018 satellite imagery to fill some gaps in the annual assessment. The two efforts together are helping to set the stage for advancing the SAV survey work to integrate satellite assessment into annual work plans. Calibration to historical information will be needed. Implications for regulatory assessments are open to discussion.

Brooke discussed there is Bay-wide SAV monitoring program that is based on imagery from low flying aircraft. They take the imagery and convert it into GIS for SAV maps. However, it is difficult to organize with the flight contractors, and it is expensive. Also, weather can interfere with getting good photographs. People are now looking into using satellite imagery to map SAV. They are working with ODU to get satellite imagery to do the 2018 assessment because during the summer of 2018 the aircraft couldn't fly due to weather and budgeting issues. The satellite imagery is very high resolution and a government organization can request high resolution for free. It is a statutory requirement to do an annual SAV survey of the Bay. Therefore, the EPA can request the imagery for free, and then they just need to figure out how to use it. Zimmerman Lab at ODU is currently working on figuring that out using algorithms and artificial intelligence. As a result, Peter and Brooke wrote a proposal to go over the method in a STAC workshop. The purpose of the workshop would be figuring out what needs to be done, do results match up with historical information, figuring out how to get the images, should we use a hybrid method of satellite imagery and aircraft, and more. Due to everything that needs to be figured out, they asked for four, two day workshops. There would be a maximum of probably 20 people at the workshop.

Tom stated that he knew a RFP came out to measure hypoxia in the mainstem in the Bay. Is that period closed? Peter said it is through the Chesapeake Bay Trust and Peter has not seen a closed date.

12:00AM **Adjourn**